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USER MOBILITY IN A VOICE RECOGNITION ENVIRONMENT

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RELATED APPLICATIONS

Not applicable

5 FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

MICROFICHE APPENDIX

Not applicable

10 BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The invention is related to the field of voice recognition, and in particular, to a system that provides customized voice recognition data to various types of voice recognition devices.

2. DESCRIPTION OF THE PRIOR ART

15 A device capable of voice recognition receives an audible voice command from a user and translates the voice command into an electronic or optical signal indicating the command. There are two primary types of voice recognition - speaker dependent and speaker independent. With speaker dependent voice recognition, the device recognizes

20 voice commands by using a user profile that is specific to the user. With speaker independent voice recognition, the device recognizes voice commands with a generic profile that is the same for all users. Speaker dependent voice recognition devices generally operate better than speaker independent devices.

For speaker dependent voice recognition, the user creates their user profile in a time-consuming process referred to as "training". The user trains a device by recording several voice commands prior to normal device operation to generate a user profile with the pre-recorded voice commands. During normal operation, the device then compares

5 newly received voice commands to the pattern made from pre-recorded voice commands to translate the new voice command into an electric signal indicating the command. The device then implements the command. The device may also modify the pre-recorded commands based on successful command translations or based on the introduction of new commands.

10 Unfortunately, the above system requires the user to re-train each new voice recognition device. To address this problem, centralized voice recognition systems have been developed to house multiple user profiles. When a device receives a voice command from a user, the device transfers an electronic version of the voice command to the central system along with a user identifier (ID). The central system uses the user ID to

15 retrieve the user profile and uses the user profile to translate the voice command. The central system then transfers the translated command to the appropriate device for implementation. Advantageously, the user may use voice commands to control multiple devices without re-training each device. Unfortunately, centralized command translation requires every device to transfer each voice command over a quality communication link

20 to the central system for voice translation.

To address this problem, a central system that stores multiple user profiles may be adapted to download a user's profile to the given device that the user desires to operate. When a user starts to operate the device, the device transfers the user ID to the central

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system. The central system uses the user ID to retrieve the appropriate user profile and transfer that user profile to the device. The device then uses the selected user profile for voice command translation. Advantageously, the user may operate various devices using their own profile without re-training and without centralized command translation.

5   Unfortunately, this adapted central system treats all devices the same. Different types of devices may have different voice recognition capabilities and commands. Different devices may also use different protocols for communicating with the central system. For example, a voice-activated telephone will have different capabilities, commands, and protocols than a voice-activated toy or a voice-activated word processor-

10   although some capabilities, commands, and protocols may be the same. A voice recognition system is needed that can provide voice recognition data that is customized for both the user and the device.

SUMMARY OF THE INVENTION

The invention helps solve the above problems with a voice recognition system that provides voice recognition data that is customized for both the user and the device. Advantageously, new devices with different voice recognition capabilities and formats may still share trained commands and data, but receive it their own customized format. Thus, the user need not retrain the same commands on each different type of device.

20   Some examples of the invention include a voice recognition system or method of operation where the voice recognition system includes a first device, a processing system, and possibly a second device. The first device receives a first signal indicating a first user ID for a first user. The first device transfers a second signal indicating a first device ID for

the first device and indicating the first user ID to the processing system. The processing

system obtains a first device voice recognition profile based on the first device ID and

obtains a first user voice recognition profile based on the first user ID. The processing

system generates a first set of voice recognition data customized for the first device and

5   the first user based on the first device voice recognition profile and the first user voice

recognition profile. The processing system transfers a third signal indicating the first set of

the voice recognition data to the first device. The first device indicates voice command

readiness in response to the first set of the voice recognition data. The first device

receives a first voice command from the first user. The first device translates the first

10   voice command based on the first set of the voice recognition data.

In some examples of the invention, the second device receives a fourth signal

indicating the first user ID. The second device transfers a fifth signal indicating a second

device ID for the second device and indicating the first user ID to the processing system.

The processing system obtains a second device voice recognition profile based on the

15   second device ID and obtains the first user voice recognition profile based on the first user

ID. The second device voice recognition profile is different from the first device voice

recognition profile to reflect different voice recognition capabilities between the first device

and the second device. The processing system generates a second set of the voice

recognition data customized for the second device and the first user based on the second

20   device voice recognition profile and the first user voice recognition profile. The processing

system transfers a sixth signal indicating the second set of the voice recognition data from

the processing system to the second device. The second device indicates voice

command readiness in response to the second set of the voice recognition data. The

second device receives a second voice command from the first user and translates the

second voice command based on the second set of the voice recognition data.

In some examples of the invention, the first device receives a fourth signal

indicating a second user ID for a second user. The first device transfers a fifth signal

5   indicating the first device ID and indicating the second user ID to a processing system.

The processing system obtains the first device voice recognition profile based on the first

device ID and obtains a second user voice recognition profile based on the second user

ID. The second user voice recognition profile is different from the first user voice

recognition profile to reflect different voice recognition characteristics between the first

10   user and the second user. The processing system generates a second set of the voice

recognition data customized for the first device and the second user based on the first

device voice recognition profile and the second user voice recognition profile. The

processing system transfers a sixth signal indicating the second set of the voice

recognition data to the first device. The first device indicates voice command readiness in

15   response to the second set of the voice recognition data. The first device receives a

second voice command from the second user and translates the second voice command

based on the second set of the voice recognition data.

In some examples of the invention, the second device receives a fourth signal

indicating a second user ID for a second user. The second device transfers a fifth signal

20   indicating a second device ID for the second device and indicating the second user ID to

the processing system. The processing system obtains a second device voice recognition

profile based on the second device ID and obtains a second user voice recognition profile

based on the second user ID. The processing system generates a second set of the

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voice recognition data customized for the second device and the second user based on the second device voice recognition profile and the second user voice recognition profile. The processing system transfers a sixth signal indicating the second set of the voice recognition data from the processing system to the second device. The second device

5   indicates voice command readiness in response to the second set of the voice recognition data. The second device receives a second voice command from the second user into the second device and translates the second voice command based on the second set of the voice recognition data.

In some examples of the invention, the first device transfers a fourth signal

10   indicating new voice recognition data for the first user to the processing system, and the processing system modifies the first user voice recognition profile based on the new voice recognition data for the first user. In some examples of the invention, the first device transfers a fourth signal indicating new voice recognition data for the first device to the processing system, and the processing system modifies the first device voice recognition

15   profile based on the new voice recognition data for the first device.

In some examples of the invention, the second signal may indicate the first user voice recognition profile. The second signal may indicate the first device voice recognition profile. The generation of the first set of the voice recognition data that is customized for the first device and the first user based on the first device voice recognition profile and the

20   first user voice recognition profile may comprise translating a command recognition library for the first user into a format suitable for the first device. The translation of the first voice command based on the first set of the voice recognition data may comprise converting audible user speech into an electronic signal indicating the first voice command.

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Some examples of the invention include a processing system or method of operation where the processing system includes a communication interface and control system. The communication interface receives a first signal from a first device indicating a first user ID for a first user and a first device ID for the first device. The control system

5 obtains a first device voice recognition profile based on the first device ID and obtains a first user voice recognition profile based on the first user ID. The control system generates a first set of voice recognition data customized for the first device and the first user based on the first device voice recognition profile and the first user voice recognition profile. The communication interface transfers a second signal to the first device

10 indicating the first set of the voice recognition data.

In some examples of the invention, the communication interface receives a third signal from a second device indicating the first user ID and a second device ID for the second device. The control system obtains a second device voice recognition profile based on the second device ID. The control system generates a second set of the voice recognition data customized for the second device and the first user based on the second

15 device voice recognition profile and the first user voice recognition profile. The communication interface transfers a fourth signal to the second device indicating the second set of the voice recognition data.

In some examples of the invention, the communication interface receives a third

20 signal from the first device indicating a second user ID for a second user and the first device ID. The control system obtains the first device voice recognition profile based on the first device ID and obtains a second user voice recognition profile based on the second user ID. The control system generates a second set of the voice recognition data

customized for the first device and the second user based on the first device voice recognition profile and the second user voice recognition profile. The communication interface transfers a fourth signal to the first device indicating the second set of the voice recognition data.

5   In some examples of the invention, the communication interface receives a third signal from a second device indicating a second user ID for a second user and a second device ID for the second device. The control system obtains a second device voice recognition profile based on the second device ID and obtains a second user voice recognition profile based on the second user ID. The control system generates a second set of the voice recognition data customized for the second device and the second user based on the second device voice recognition profile and the second user voice recognition profile. The communication interface transfers a fourth signal to the second device indicating the second set of the voice recognition data.

       In some examples of the invention, the communication interface receives a third signal indicating new voice recognition data for the first user from the first device and the control system modifies the first user voice recognition profile based on the new voice recognition data for the first user. In some examples of the invention, the communication interface receives a third signal indicating new voice recognition data for the first device from the first device and the control system modifies the first device voice recognition profile based on the new voice recognition data for the first device.

20   Some examples of the invention include a software product comprising storage media that stores software that directs a control system to: 1) receive a first user ID for a first user and a first device ID for a first device from a communication interface, 2) obtain a

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first device voice recognition profile based on the first device ID, 3) obtain a first user

voice recognition profile based on the first user ID, 4) generate a first set of voice

recognition data customized for the first device and the first user based on the first device

voice recognition profile and the first user voice recognition profile, and 5) transfer the first

5   set of the voice recognition data to the communication interface for transfer to the first

device.

In some examples of the invention, the software also directs the control system to:

6) receive the first user ID and a second device ID for a second device from the

communication interface, 7) obtain a second device voice recognition profile based on the

10   second device ID, 8) obtain a first user voice recognition profile based on the first user ID,

9) generate a second set of the voice recognition data customized for the second device

and the first user based on the second device voice recognition profile and the first user

voice recognition profile, and 10) transfer the second set of the voice recognition data to

the communication interface for transfer to the second device.

In some examples of the invention, the software also directs the control system to:

15   6) receive a second user ID for a second user and the first device ID from the

communication interface, 7) obtain the first device voice recognition profile based on the

first device ID, 8) obtain a second user voice recognition profile based on the second user

ID, 9) generate a second set of the voice recognition data customized for the first device

20   and the second user based on the first device voice recognition profile and the second

user voice recognition profile, and 10) transfer the second set of the voice recognition data

to the communication interface for transfer to the first device.

In some examples of the invention, the software also directs the control system to:

6) receive a second user ID for a second user and a second device ID for a second device from the communication interface, 7) obtain a second device voice recognition profile based on the second device ID, 8) obtain a second user voice recognition profile based on the second user ID, 9) generate a second set of the voice recognition data customized for the second device and the second user based on the second device voice recognition profile and the second user voice recognition profile, and 10) transfer the second set of the voice recognition data to the communication interface for transfer to the second device.

In some examples of the invention, the software also directs the control system to receive new voice recognition data for the first user from the communication interface and modify the first user voice recognition profile based on the new voice recognition data for the first user. In some examples of the invention, the software also directs the control system to receive new voice recognition data for the first device from the communication interface and modify the first device voice recognition profile based on the new voice recognition data for the first device. In some examples of the invention, the software also directs the control system to receive the first user voice recognition profile from the communication interface. In some examples of the invention, the software also directs the control system to receive the first device voice recognition profile from the communication interface. In some examples of the invention, the software also directs the control system to translate a command recognition library for the first user into a format suitable for the first device.

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BRIEF DESCRIPTION OF THE DRAWINGS

The same reference number represents the same element on all drawings.

FIG. 1 illustrates a voice recognition system in an example of the invention.

FIG. 2 illustrates voice recognition system operation in an example of the invention.

5 FIG. 3 illustrates voice recognition system operation in an example of the invention.

FIG. 4 illustrates voice recognition system operation in an example of the invention.

FIG. 5 illustrates voice recognition system operation in an example of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

10 Voice Recognition System Configuration -- FIG. 1

FIG. 1 illustrates voice recognition system 100 in an example of the invention. Voice recognition system 100 is comprised of devices 101-103 and processing system 110. There could be additional devices, but only three are shown for clarity. Processing system 110 is comprised of communication interface 111 and control system 112. Control system 112 includes storage media 113. Storage media 113 stores control software 114, user profiles 115, device profiles 116.

A single user or multiple users may operate devices 101-103 through spoken commands. A user typically has a user ID and a corresponding user voice recognition profile in user profiles 115. A user voice recognition profile indicates a user's personal

20 information and trained commands. One example of a simplified voice recognition profile for a user follows below. The first table contains personal data, and the second table contains the commands and corresponding user voice patterns. Note that command #21 is an alternate command name, and numerous such entries may be included.

USER DATA	
USER ID	JOHN DOE #1
DATE OF BIRTH	2/5/65
NATIONALITY	CHINESE
LANGUAGE	MANDARIN #2

COMMAND #	SPOKEN COMMAND	USER'S DIGITAL VOICE PATTERN FOR COMMAND
COMMAND #1	ON	1010111110 …
COMMAND #2	OFF	0001010101 …
COMMAND #3	VIEW MENU	1010100110 …
COMMAND #4	MENU LEFT	1010110100 …
COMMAND #5	MENU RIGHT	0010111000 …
COMMAND #6	MENU UP	0010110100 …
COMMAND #7	MENU DOWN	1010000100 …
COMMAND #8	MENU SELECT	1101000100 …
COMMAND #9	ONE	0111000010 …
COMMAND #10	TWO	1101001101 …
COMMAND #11	THREE	0001100100 …
COMMAND #12	FOUR	1100101010 …

COMMAND #13	FIVE	0001011111 …
COMMAND #14	SIX	1101000110 …
COMMAND #15	SEVEN	1110100011 …
COMMAND #16	EIGHT	0010100010 …
COMMAND #17	NINE	1111100100 …
COMMAND #18	TEN	0101001010 …
COMMAND #19	YES	0001011100 …
COMMAND #20	NO	1111011101 …
COMMAND #21	START	COMMAND #1 PATTERN

Devices 101-103 could be computers, telephones, toys, appliances, video equipment, or other systems that perform voice recognition. Based on this disclosure, those skilled in the art will readily understand how to modify existing devices to operate in accord with the invention. Each device has device ID and a corresponding device voice recognition profile. A device voice recognition profile indicates device characteristics, commands, and corresponding instructions used by the device for voice recognition. A class of devices could be established that share the same voice recognition profile, so a single profile or portions of the profile would be stored and shared for multiple devices.

10   One example of a simplified voice recognition profile for a device follows below. The first table contains device characteristic data, and the second table contains commands and corresponding instruction sequences that are invoked by the commands.

DEVICE CHARACTERISTIC	CHARACTERISTIC DATA
DEVICE ID	ABC12345
PROCESSOR TYPE	PENTIUM 3
PROCESSOR SPEED	833 MHZ
RAM	500 MB
VOICE RECOGNITION ALGORITHM	ACME VERSION 2.5
COMMUNICATION PROTOCOL	TCP/IP
MESSAGE FORMAT	ACME MESSENGER
NETWORK ADDRESS	123.456.7890
STORAGE FORMAT	ABC VERSION 3.5

COMMAND #	SPOKEN COMMAND	COMMAND INSTRUCTION SEQUENCE
COMMAND #1	ON	A
COMMAND #2	OFF	B
COMMAND #3	LOUDER	C
COMMAND #4	QUIETER	D
COMMAND #5	VIEW MENU	E
COMMAND #6	MENU LEFT	F
COMMAND #7	MENU RIGHT	G
COMMAND #8	MENU UP	H

COMMAND #9	MENU DOWN	I
COMMAND #10	MENU SELECT	J
COMMAND #11	CHANGE CHANNEL	K
COMMAND #12	VIEW PROGRAM GUIDE	L
COMMAND #13	PLAY	M
COMMAND #14	REWIND	N
COMMAND #15	FAST FORWARD	O
COMMAND #16	GO TO FRONT	P
COMMAND #17	PAUSE	Q
COMMAND #18	RECORD	R
COMMAND #19	STOP	S
COMMAND #20	CHANNEL	T

Device 101 receives audible voice commands from the user. Device 101 uses voice recognition data to translate the voice commands into signals indicating the commands. Device 101 implements the commands indicated by the signals.

5   Advantageously, the voice recognition data is provided by processing system 110 and is customized for both the user and device 101.

Device 101 communicates with communication interface 111 to receive the customized voice recognition data. For example, device 101 may exchange messages with communication interface 111 over a Local Area Network (LAN), the

10   Internet, a Bluetooth interface, or some other communication link. Device 101 transfers a

user ID and its own device ID to the processing system to request the custom voice recognition data. Devices 102-103 would be similar.

Communication interface 111 exchanges messages with devices 101-103 for control system 112. Communication interface 111 could be an wireline LAN card, a

5   wireless network card, Bluetooth interface, or some other communication equipment -- typically with the appropriate protocol stacks and device drivers. Communication interface 111 exchanges message information with control system 112.

Control system 112 could be comprised of control circuitry and memory. Storage media 113 could be comprised of disks, tape, integrated circuits, servers, or some other

10   type of memory device. Control system 112 retrieves control software 114 from storage media 113. Control system 112 executes control software 114 to operate in accord with the invention. Control system 112 also retrieves user profiles 115 and device profiles 116 from storage media 113.

Together, communication interface 111 and control system 112 could be comprised

15   of standard computer systems -- including processors, memory, and network interfaces - that are programmed in accord with the invention. Those skilled in the art will appreciate how other forms of circuitry, such as application specific integrated circuits and programmable gate arrays, could be used to make processing system 110 instead of using a programmed computer system. Control software 114 may include firmware in

20   some examples of the invention.

Control system 112 receives a specific user ID and a specific device ID through communication interface 111. Control system 112 uses the user ID to retrieve the corresponding user profile from user profiles 115. Control system 112 uses the device ID

to retrieve the corresponding device profile from device profiles 116. Control system 112

processes the retrieved user and device profiles to generate voice recognition data that is

customized for both the user and the device. Control system 112 then transfers the

customized voice recognition data through communication interface 111 to the device.

5   To generate the voice recognition data, control system 112 includes user voice

patterns from the user profile that correspond to spoken commands in the device profile --

the commands that are known to the device. Control system 112 may also substitute by

using a voice pattern from the user profile to invoke a related instruction sequence from

the device profile. For example, control system may use the voice pattern for "go" as a

10   substitute for the term "start". Advantageously, a device gets previously trained

commands from a user profile if the user commands correspond to device commands or

instruction sequences in the device profile. By selecting only the trained voice commands

that the device knows, the device is not burdened with the entire command set in the user

profile. As devices train new commands, the new commands are added to the user profile

15   for subsequent use by other devices. Many commands, such as on/off, letters and

numbers, and menu operations can be shared across multiple device without retraining

each device. Thus, control system 112 translates the user's existing command

recognition library into a format suitable for the device.

Command training can be accomplished in numerous ways. Many devices will

20   prompt the user to speak a command and store the resulting users voice pattern in

association with the proper instruction sequence. Alternatively, other device may be used

to obtain user voice patterns for new commands and transfer the user voice patterns to

processing system 110 for implementation. For example, users could place a telephone

call to system that records and forwards voice prints for new commands. Processing

system 110 may be equipped with a voice interface, such as over the public telephone

network or the Internet, to obtain user voice patterns for new commands.

Control system 112 may perform data conversion and formatting on the user profile

5   to generate voice recognition data that is consistent with the capabilities and protocols

used by the device. Typically this would resolve differences in sampling rates, encoding

methods, or command terminology. Different voice recognition algorithms may require

different formatting, so control system 112 formats the data to be suitable for each device.

The nationality, age, or language of the user may or may not be important to the device,

10   so control system may include such information in the voice recognition data. The

processor and memory capacity of the device may affect the scope and abstraction of the

voice recognition data generated by control system 112. Different devices may use

different encoding standards, so control system 112 uses the appropriate encoding

standard for each device. Control system 112 assesses these and other such factors to

15   generate the custom voice recognition data from the user profile and the device profile.

Voice Recognition System Operation -- FIGS. 2-5

FIGS. 2-5 illustrate voice recognition system operation in an example of the

invention. On FIG. 2, a first device receives a signal indicating a user ID for a first user.

20   The first device transfers a signal to the processing system indicating a device ID for the

first device and indicating the user ID for the first user. The processing system uses the

device ID to obtain the device voice recognition profile for the first device and uses the

user ID to obtain the user voice recognition profile for the first user.

The processing system generates a set of voice recognition data customized for the first device and the first user based on the device voice recognition profile for the first device and the user voice recognition profile for the first user. For example, the processing system determines if any user voice patterns in the user profile match with any

5   spoken commands in the device profile. The processing system transfers a signal to the first device indicating its custom set of the voice recognition data, and when done loading, the first device indicates that it is ready to receive voice commands. The first device receives a voice command from the first user and translates the voice command based on this custom set of the voice recognition data. The first device then invokes the instruction

10   sequence that corresponds to the translated command in the device profile.

A second device also receives a signal indicating the user ID for the first user. The second device transfers a signal to the processing system indicating a device ID for the second device and indicating the user ID for the first user. The processing system uses the device ID to obtain the device voice recognition profile for the second device and uses

15   the user ID to obtain the user voice recognition profile for the first user. Note that the device voice recognition profile for the second device may be different from the device voice recognition profile for the first device to reflect different voice recognition capabilities between the first device and the second device.

The processing system generates a set of voice recognition data customized for

20   the second device and the first user based on the device voice recognition profile for the second device and the user voice recognition profile for the first user. The processing system transfers a signal to the second device indicating its custom set of the voice recognition data, and when done loading, the second device indicates that it is ready to

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receive voice commands. The second device receives a voice command from the first user and translates the voice command based on this custom set of the voice recognition data. The second device then invokes the instruction sequence that corresponds to the translated command in the device profile.

5   On FIG. 3, the first device receives a signal indicating a user ID for a second user. The first device transfers a signal to the processing system indicating a device ID for the first device and indicating the user ID for the second user. The processing system uses the device ID to obtain the device voice recognition profile for the first device and uses the user ID to obtain the user voice recognition profile for the second user. Note that user

10   voice recognition profile for the second user is different from the user voice recognition profile for the first user to reflect different voice recognition characteristics between the first user and the second user.

The processing system generates a set of voice recognition data customized for the first device and the second user based on the device voice recognition profile for the

15   first device and the user voice recognition profile for the second user. The processing system transfers a signal to the first device indicating its custom set of the voice recognition data, and when done loading, the first device indicates that it is ready to receive voice commands. The first device receives a voice command from the second user and translates the voice command based on this custom set of the voice recognition

20   data. The first device then invokes the instruction sequence that corresponds to the translated command in the device profile.

The second device also receives a signal indicating the user ID for the second user. The second device transfers a signal to the processing system indicating a device

ID for the second device and indicating the user ID for the second user. The processing

system uses the device ID to obtain the device voice recognition profile for the second

device and uses the user ID to obtain the user voice recognition profile for the second

user.

5   The processing system generates a set of voice recognition data customized for

the second device and the second user based on the device voice recognition profile for

the second device and the user voice recognition profile for the second user. The

processing system transfers a signal to the second device indicating its custom set of the

voice recognition data, and when done loading, the second device indicates that it is

10   ready to receive voice commands. The second device receives a voice command from

the second user and translates the voice command based on this custom set of the voice

recognition data. The second device then invokes the instruction sequence that

corresponds to the translated command in the device profile.

          On FIG. 4, a device receives a signal indicating a user ID. The device transfers a

15   signal to the processing system indicating its device ID and the user ID. The processing

system determines that there is no user profile for the user ID and transfers a signal

indicating this to the device. The processing system may also transfer an application to

the device to assist in user profile creation. The device prompts the user to train the

device and generate the user profile. To perform the training, the device prompts the user

20   for spoken commands and records the resulting voice patterns in association with the

proper instruction sequences. The device transfers a signal to the processing system

indicating the user profile data. The processing system stores the new user profile and

associated data and generates a set of voice recognition data customized for the device

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and the user based on the device voice recognition profile for the device and the user

voice recognition profile for the user. The processing system transfers a signal to the

device indicating its custom set of the voice recognition data. The device prompts the

user to indicate that voice command capability is available. The device then receives a

5   voice command from the user and translates the voice command based on this custom

set of the voice recognition data. The device then invokes the instruction sequence that

corresponds to the translated command in the device profile.

During subsequent operation, the device may acquire new voice recognition data,

such as newly trained commands, data related to successful translations, or other

10   changes to a user profile. The device transfers this new data to the processing system.

The processing system modifies the user's profile based on the new data. This user

profile update process could be designed to occur periodically.

Alternatively, the processing system and/or the device may use various means to

perform the training. For example, the processing system may use a separate system,

15   such as an automated telephonic voice response system, to prompt the user and collect

the user profile. The device may prompt the user to use a separate system to collect the

user profile.

On FIG. 5, a device receives a signal indicating a user ID. The device transfers a

signal to the processing system indicating its device ID and the user ID. The processing

20   system determines that there is no device profile for the device ID and transfers a signal

indicating this to the device. As indicated above, the device profile associates identifiers

or names for spoken commands received by the device with instruction sequences

responsively invoked by the device. The device may indicate the need for a device profile

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to the user and may assist in device profile creation. The processing system may transfer an application to the device to assist in device profile creation. The device generates its device profile and transfers a signal to the processing system indicating the device profile. The profile must be created and stored on the processing system from the device data

5   message. The processing system then generates a set of voice recognition data customized for the device and the user based on the device voice recognition profile for the device and the user voice recognition profile for the user. The custom data could include voice patterns from the user profile that match identifiers or names for spoken commands from the device profile. The custom data could also include identifiers or

10   names for spoken commands and voice patterns from the user profile that can be associated with instruction sequences in the device profile. For example, the spoken command and voice profile for the term "go" from the user profile could be substituted for the term "start" in the device profile and associated with the instruction sequence associated with the start command. The processing system transfers a signal to the

15   device indicating its custom set of the voice recognition data, and when done loading, the device indicates that it is ready to receive voice commands. The device receives a voice command from the user and translates the voice command based on this custom set of the voice recognition data. The device then invokes the instruction sequence that corresponds to the translated command in the device profile.

20   During subsequent operation, the device may be upgraded with a modified or new device profile. The device transfers this new data to the processing system. The processing system modifies the device profile based on the new data.

The creation of user and device profiles may be an iterative process. Some devices may require an entirely trained command set before operation while other devices may operate with a partially trained command set. Thus, the user and device profiles may build over time as existing devices are used more extensively and new devices are

5   introduced. The users, devices, and processing system interact to continually add to and modify the user and device profiles.

FIGS. 1-5 and the above description depict specific examples of a voice recognition system in accord with the present invention. Those skilled in the art will appreciate that some conventional aspects of the voice recognition system have been simplified or

10   omitted for clarity. Those skilled in the art will appreciate that the features described above could be combined in various ways to form multiple variations of the invention. Those skilled in the art will also appreciate variations of the voice recognition system that fall within the scope of the invention. As a result, the invention is not limited to the specific examples described above, but only by the following claims and their equivalents.

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CLAIMS: